

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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|---|---|---|
| Applicant's or agent's file reference<br>FP00-0236-00   | <b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) |   |
| International application No.<br>PCT/JP00/07956   | International filing date (day/month/year)<br>10 November 2000 (10.11.00)   | Priority date (day/month/year)<br>10 November 1999 (10.11.99) |
| International Patent Classification (IPC) or national classification and IPC<br>G02B 13/00, 3/00, 3/06, H01S 5/02 |   |   |
| Applicant<br>HAMAMATSU PHOTONICS K.K.   |   |   |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

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|---|--|
| Date of submission of the demand<br>10 November 2000 (10.11.00) | Date of completion of this report<br>14 August 2001 (14.08.2001) |
| Name and mailing address of the IPEA/JP                         | Authorized officer   |
| Facsimile No.   | Telephone No.  |

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/JP00/07956

## I. Basis of the report

1. With regard to the **elements** of the international application:\*

- ☐ the international application as originally filed
- ☒ the description:  
pages \_\_\_\_\_ 1-15 \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
pages \_\_\_\_\_ 2-10 \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, as amended (together with any statement under Article 19  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_ 1,11-12 \_\_\_\_\_, filed with the letter of \_\_\_\_\_ 13 April 2001 (13.04.2001)
- ☒ the drawings:  
pages \_\_\_\_\_ 1/10-10/10 \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.  
PCT/JP 00/7956

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

|                               |        |      |     |
|-------------------------------|--------|------|-----|
| Novelty (N)                   | Claims | 1-12 | YES |
|                               | Claims |      | NO  |
| Inventive step (IS)           | Claims |      | YES |
|                               | Claims | 1-12 | NO  |
| Industrial applicability (IA) | Claims | 1-12 | YES |
|                               | Claims |      | NO  |

## 2. Citations and explanations

Document 1: JP, 58-168026, A (Agency of Industrial Science and Technology), 4 October 1983 (04.10.83); entire text and all drawings (Family: none)

Document 2: JP, 57-181516, A (Agency of Industrial Science and Technology), 9 November 1982 (09.11.82); entire text and all drawings (Family: none)

Document 3: US, 5004328, A (Canon Inc.), 2 April 1991 (02.04.91); entire text and all drawings & JP, 63-96618, A; entire text and all drawings & JP, 63-81413, A; entire text and all drawings

Document 4: JP, 9-96760, A (Mitsui Petrochemical Industry Ltd.), 8 April 1997 (08.04.97); entire text and all drawings (Family: none)

Document 5: JP, 4-284401, A (Fujitsu Ltd.), 9 October 1992 (09.10.92); entire text and all drawings (Family: none)

## Claim 1

Forms of optical lens comprising a first optical member capable of acting as a lens and a second optical member capable acting as a lens wherein the aforementioned

first optical member is embedded are in themselves well known from the prior art, being disclosed in Document 1 to Document 3.

Lenses with composite lens members comprising optical members having a curved surface along the X axis perpendicular to the Z axis, where the Z axis is the optical axis, with a plurality of such optical members being arranged in an array, and an optical member having a curved surface along the Y axis perpendicular to the X axis, are also well known from the prior art, being disclosed in Document 4 and Document 5. Therefore, a person skilled in the art could easily conceive of adopting an aforementioned embedded lens structure disclosed in Document 1 to 3 for a specific form of lens well known from the aforementioned prior art with optical members having a curved surface along the X axis - a plurality of such optical members being arranged in an array - and an optical member having a curved surface along the Y axis, to give an optical lens set forth in Claim 1.

Claim 1 further specifies that this is an optical lens for emitting light from a semiconductor array comprising an arrangement of a plurality of light emitting elements after acting on said light; however, this does not constitute a special technical feature as regards the invention of an optical lens as a product, since it does not call for the invention of the product to have specific characteristics such as structure or shape.

#### Claims 2 and 3

Claims 2 and 3 specify the relationships between the thermal expansion coefficients and deformation points of the first light transmitting material constituting the first optical members and the second light transmitting material constituting the second optical member. However,

in the light of the description, the aforementioned specified features can be considered to depend solely on characteristics of the method of production rather than characterizing the structure, shape or properties of the optical lens which is the product, and thus do not constitute special technical features in inventions of a product.

Claims 4, 5, 7 and 8

The specific shapes of the first optical members and the second optical member are such as could be suitably decided by a person skilled in the art.

Claim 6

The arrangement of the columnar optical members is such as could be suitably decided by a person skilled in the art. The specific feature of an arrangement whereby they make contact at contact planes formed on the sides thereof does not constitute a special technical feature.

Claim 9

Use of suitable holding structures and regulating structures especially for holding and regulating the position of the members is conventional practice. Therefore, the feature specified in Claim 9 does not constitute a special technical feature.

Claim 10

Use of multiple layers is simply a design feature, and a multistage structure is also disclosed in Document 5.

Claim 11

Claim 11 specifies fabrication by a drawing process. However, the aforementioned specified feature does not

characterize the structure or shape of the optical lens as the invention of a product, and does not constitute a special technical feature.

Claim 12

Claim 12 is an invention of an optical system provided with a semiconductor laser array, optical lenses and a light receiving device; however, optical systems provided with a semiconductor laser array, optical lenses and a light receiving device are in themselves well known from the prior art and cannot constitute a special technical feature. Examples of optical systems provided with a semiconductor laser array, optical lenses and a light receiving device are disclosed in Document 4 and Document 5, and especially in Document 5.